Johns Notes

Please see the attached Dewey-Burdock License, amendment 1 from 2016… approval of financial assurance and two other issues were resolved. Just want to make sure you are working from the latest version.

ML16202A050ML16202A142.pdf - November 1, 2016 cover letter from NRC
ML16202A050ML16202A158.pdf - November 1, 2016 SER update
ML16202A050ML16202A174.pdf – SUA 1600 Amendment 1

Please see some excerpts from
LC 9.2 – [this is the magic list of documents that comprise the license application and are incorporated into license by reference as requirements]
LC 9.4 (c) and
LC 12.1 which may be helpful.

The Environmental Report (ER) is found under several files under ML091200014…
I count at least 10 files related to main text of the ER. [this folder contains the original documents]

There are 64 total files in the packet which also includes the Technical Report (TR, and other part of the application).

ML092870160 is a packet with the re-submittal and supplement to both the TR and ER.
Yes the commitments in the ER are license conditions according to LC 9.2.

LC 9.2 The licensee shall conduct operations in accordance with the commitments, representations, and statements contained in the license application dated February 28, 2009 (Accession No.ML091200014), which is supplemented by the submittals dated

1. August 10, 2009 (Accession No. ML092870160);
2. June 28, 2011 (Accession No. ML112071064);
3. February 27, 2012 (Accession No.ML120620195);
4. April 11, 2012 (Accession No. ML121030013);
5. June 13, 2012 (Accession No. ML12173A038);
6. June 27, 2012 (Accession No. ML12179A534);
7. October 19, 2012 (Accession No. ML12305A056);
8. July 3, 2014 (Accession No. ML14191A034); and
9. September 25, 2014 (Accession No. ML14295A299)

https://adamswebsearch2.nrc.gov/webSearch2/view?AccessionNumber= ML092870160

LC 9.4 Change, Test, and Experiment License Condition (c) Additionally, the licensee must obtain a license amendment unless the change, test, or experiment is consistent with the NRC staff's previous conclusions, or the basis of or analysis leading to those conclusions, regarding actions, designs, or design configurations analyzed and selected in the site or facility SER, TER, and EIS or EA. This includes all supplements and amendments to the license, as well as all SERs, TERs, EAs, and EISs associated with amendments to this license.

LC 12.1 Prior to commencement of operations in any production area, the licensee shall obtain all necessary permits, licenses, and approvals from the appropriate regulatory authorities. The licensee shall also submit a copy of all permits for its Class III and Class V underground injection wells to the NRC.

Note that the Dewey-Burdock FSEIS goes into length on mitigation measures for wildlife protection. Please see FSEIS Sections 3.6, 4.6, 6.2-6.3, 5.6 and 7.4.
3.0 Description of Affected Environment
3.6 Ecology
3.6.1.2 Wildlife
4.6 Ecological Resources Impacts
5.6 Ecological Resources
5.6.1 Terrestrial Ecology
5.6.2 Aquatic Ecology
5.6.3 Protected Species
6.2 Mitigation Measures Proposed by Powertech
6.3 Potential Mitigation Measures Identified by the U.S. Nuclear Regulatory Commission
7.4 Ecological Monitoring
7.4.1 Vegetation Monitoring
7.4.2 Wildlife Monitoring

Weblinks for the FSEIS
Vol 1: [HYPERLINK "https://www.nrc.gov/docs/ML1402/ML14024A477.pdf"]
Vol 2: [HYPERLINK "https://www.nrc.gov/docs/ML1402/ML14024A478.pdf"]

As you may know, there are specific wildlife conditions prepared in coordination with SD GFP within the proposed conditions prepared by DENR staff. Please see the follow link from SD DENR's website DENR Recommendation and Permit Conditions page 6.

Yes the documents you reference appear to be the same as the descriptions you have provided.

What I found in the SEIS
Executive Summary

p. xxxvii Ecological Resources
Following recommended fencing and power line construction designs will minimize impediments to game and avian movement.

p. xxxviii
following U.S. Fish and Wildlife Service (FWS) and South Dakota Game, Fish, and Parks (SDGFP) seasonal noise, vehicular traffic, and human proximity guidelines will help to ensure the continued nesting success of area raptors.

Wastewater solutions include levels of chemical constituents that are potentially harmful to wildlife; however, proposed practices and state regulatory controls including permit conditions, monitoring requirements, and action levels would limit direct contact and potential impacts.

Monitoring and action levels for environmental concentrations of wastewater constituents in land application areas will allow regulators to impose mitigations if constituents accumulate above levels of concern.

Fencing would further limit wildlife access to liquid waste holding ponds. Potential conflicts between active raptor nest sites and project-related activities will continue to be mitigated by annual raptor monitoring and mitigation plans.

1.7.1 Endangered Species Act of 1973 Consultation
In accordance with NEPA regulations and other environmental laws and rules [e.g., Fish and Wildlife Coordination Act and Executive Order 11990 (Protection of Wetlands)], FWS encouraged the following when reviewing potential impacts to wetlands at the proposed Dewey-Burdock ISR Project: (i) avoidance of wetlands, if possible; (ii) minimization of impacts to wetlands if they cannot be avoided; and (iii) replacement of wetland values that may be impacted by the project (FWS, 2010).

1.7.3.6 Coordination With South Dakota Department of Environment and Natural Resources

SDDENR would coordinate with SDGFP to mitigate the potential effects of surface impoundments on wildlife; mitigation measures discussed included the use of netting and fencing to protect wildlife and implementing protocols to assess the effects of wastewater constituents on wildlife.

1.7.3.7 Coordination With South Dakota Game Fish and Parks

NRC staff met with SDGFP staff on November 30, 2009, to discuss potential impacts on ecological resources at the proposed Dewey-Burdock ISR Project.

SDGFP expressed a major concern: the potential effects on birds flying through the proposed project area and drinking at exposed wastewater evaporation ponds.

SDGFP suggested two measures to mitigate effects on bird populations:

(i) testing to determine the toxicity of constituents in the evaporation ponds and

(ii) using netting and fencing to restrict wildlife access to exposed ponds.

SDGFP also noted the need for testing and monitoring of soils at the proposed site to identify any buildup of salts and metals that could result from proposed land application of treated wastewater

FWS (U.S. Fish and Wildlife Service). "Re: Follow Up for the Proposed Dewey-Burdock *In-Situ* Recovery Project, Fall River and Custer Counties, South Dakota." Email (September 9) Terry Quesinberry, Fish and Wildlife Biologist. ML13256A314. Pierre, South Dakota: FWS. 2013.

FWS. "Re: Follow Up for the Proposed Dewey-Burdock *In-Situ* Recovery Project, Fall River and Custer Counties, South Dakota." Email (August 27) Terry Quesinberry, Fish and Wildlife Biologist. ML12240A317. Pierre, South Dakota: FWS. 2012.

FWS. "Environmental Comments on Powertech Dewey-Burdock Project, Custer and Fall River County, South Dakota." ML100970556. Washington, DC: FWS. March 29, 2010.

2.2.4 Alternative Sites

The applicant made siting decisions to avoid proximity to historical and cultural resources, to avoid construction and operations in areas of historical environmental disturbance from past surface mining, to protect wildlife by avoidance of nesting sites for raptors, to avoid proximity to drainages, and to utilize surface and subsurface geological characteristics efficiently.

3.0 Description of Affected Environment

3.6 Ecology

The applicant conducted ecological baseline studies from July 2007 through August 2008 at the proposed Dewey-Burdock site to fulfill the objectives specified in NUREG–1569* (NRC, 2003) and to meet SDDENR, SDGFP, and U.S. Fish and Wildlife Service (FWS) guidelines (Powertech, 2009a).

* areas in NUREG-1569 referencing ecological studies have been highlighted so you can search in the comment column.

3.6.1.2 Wildlife

3.6.1.2.2 Avian Species
Raptors
Water Fowl and Shorebirds
Nongame and Migratory Birds
3.6.1.2.3 Other Mammals, Reptiles, and Amphibians
Table 3.6-3. Breeding Bird Species Observed Within the Proposed Dewey-Burdock Project Area in June 2008
3.6.2 Aquatic
3.6.3 Protected Species
Table 3.6-7. Threatened or Endangered Animals That Occur in Custer and Fall River Counties or Were Observed in the Proposed Dewey-Burdock *In-Situ* Recovery Project Area*
Table 3.6-8. Species Tracked by the South Dakota National Heritage Program Observed in the Proposed Dewey-Burdock Project Area
Whooping Crane
Bald Eagle

4.6 Ecological Resources Impacts

Impacts to wildlife could include loss, alteration, and/or incremental fragmentation of habitat; displacement of and stresses on wildlife; and direct and/or indirect mortalities. Aquatic species could be affected by disturbance of stream channels, increases in suspended sediments, fuel spills, and habitat reduction.

GEIS Construction Phase Summary

GEIS evaluation of impacts during construction included terrestrial wildlife that may be affected
through (i) habitat loss or alteration and incremental habitat fragmentation, (ii) displacement of wildlife from project construction, and (iii) direct and/or indirect mortalities from project construction. NRC staff noted in the GEIS that construction impacts to wildlife habitat will be minimized with the timely reseeding of disturbed areas following construction. In general, wildlife species will be expected to disperse from the proposed license area as construction activities approached, although smaller, less mobile species could perish during clearing and grading. Habitat fragmentation, temporary displacement, and direct or indirect mortalities will be
possible;

GEIS Operations Phase Summary

As discussed in GEIS Section 4.4.5.2, wildlife habitats could be altered by operations (fencing, traffic, and noise), and limited wildlife mortalities could occur due to conflicts between species habitat and operations. Fencing could limit access to crucial wintering habitat and water. South Dakota does not specify fencing construction. However, SDGFP field and regional personnel evaluate fencing construction design on a case-by-case basis, which may minimize impediments to big game movement (SDGFP, 2008). NRC staff noted in the GEIS that potential impacts to

vegetation may occur as a result of land application of wastewater increasing vegetation growth and/or negatively affecting vegetation from the build-up of salts in the soils. **Licensee requirements to monitor and control irrigated areas will limit impacts to ensure release limits are met.**

As further indicated in GEIS Section 4.4.5.2, temporary contamination or alteration of soils could occur from operational leaks and spills and possibly from transportation or land application of treated wastewater. However, detection and response to leaks and spills (e.g., soil cleanup) and eventual survey and decommissioning of all potentially impacted soil will limit the magnitude of impacts to terrestrial ecology. The implementation of spill detection and response plans will mitigate impacts to aquatic species from spills around well heads and from pipeline leaks. Mitigation measures, such as SDGFP-recommended fencing and netting for ponds (SEIS Section 1.7.3.7), leak detection and spill response plans, and periodic wildlife surveys, will also limit the potential impact.

GEIS Aquifer Restoration Phase Summary

GEIS Section 4.4.5.3 describes potential impacts to ecological resources during the aquifer restoration phase that are similar to operations. These impacts could include habitat disruption, spills and leaks, and animal mortalities. Because existing (in-place) infrastructure will be used during aquifer restoration, little additional ground disturbance will occur

GEIS Decommissioning Phase Summary

NRC staff concluded in the GEIS that land use impacts from decommissioning an ISR facility will be comparable to, but overall less than, those described for construction and will further decrease as decommissioning and reclamation proceed. As described in GEIS Section 4.4.5.4, during decommissioning and reclamation, there will be temporary land disturbance from soil excavation, recovery and removal of buried piping, and demolition and removal of structures. Wildlife will be temporarily displaced, but will be expected to return after decommissioning and reclamation are complete and vegetation and habitat are reestablished. Wildlife could come in conflict with heavy equipment or vehicles. Decommissioning and reclamation activities could also result in temporary increases in sediment load in local streams, but aquatic species will recover quickly as sediment load decreases. However, revegetation and recontouring will restore habitat previously altered during construction and operations. Land that is used for irrigation will be included in decommissioning surveys to ensure potentially impacted (contaminated) areas will be appropriately characterized and remediated, as necessary, in accordance with NRC regulations.

4.6.1 Proposed Action (Alternative 1)

The staff's ecological impact analysis for the proposed Dewey-Burdock ISR Project site involves evaluating interactions between the proposed project activities and the local animals and habitat that could be affected by the project. If an applicant or licensee adhered to recommended

ISR facility lifecycle phases can have direct and indirect impacts on local habitat and wildlife populations. These impacts are both short-term (lasting until successful reclamation is

achieved) and long-term (persisting beyond successful completion of reclamation). However, long-term impacts are not expected to be substantial due to the relatively limited habitat disturbance associated with the ISR extraction method. Because of increased traffic levels and physical disturbance during the construction phase, injury or mortality to wildlife will be more likely than during any of the other waste project phases. Plant and animal community alteration will be greatest under the land application option because of the large amount of land {about 308 ha [760 ac]} that will receive treated liquid waste annually from April through October.

4.6.1.1 Disposal Via Class V Injection Wells

4.6.1.1.1 Construction Impacts

The construction phase of the proposed Dewey-Burdock ISR Project could potentially impact ecological resources from clearing vegetation; constructing the central processing plant and the satellite facility; developing the holding ponds and wellfields, including drilling wells and laying pipeline; building header houses; and constructing access roads. Construction activities will also result in an increase in vehicular traffic and the potential for animal collisions with vehicles. There will also be a temporary increase in dust from construction, some of which will deposit on vegetation, both on- and offsite, affecting the ability for obligate species to forage. However, vegetation in this naturally dusty, arid region will likely have adapted to moderate, temporary increases of dust coverage. Potential impacts on wildlife from dust adjacent to access roads and disturbed land near the plant site will be limited by applicant dust control measures, such as water application (Powertech, 2009a). However, fugitive dust will still be generated from travel on unpaved roads and disturbed land (see fugitive dust analysis in SEIS Sections 4.7.1.1.1 and 4.7.1.2.1), and therefore localized areas will likely experience short-term and intermittent dust accumulation potentially affecting wildlife.

The applicant's implementation of the road and right-of-way, SDGFP-recommended fencing and netting for ponds (SEIS Section 1.7.3.7), post-construction restoration/reclamation measures, as well as those measures intended to reduce human disturbance and incidental wildlife mortalities, will minimize impacts on wildlife. The standard recommended construction mitigation measures including perimeter fencing, netting, leak detection and spill response plans, erosion controls, and other BMPs described elsewhere in the SEIS will also minimize overall ecological impacts.

BLM (2012b–d) has determined wildlife timing stipulations for certain species to protect their populations and habitats (in the table in the Raptors section). The applicant plans to initiate construction activities outside the recommended time restriction periods (Powertech, 2009a); however, activities will continue year round within the area of approved disturbance (e.g., wellfield patterns, roads, plant areas). BLM South Dakota wildlife timing restrictions are included in the table in the Raptors section.

4.6.1.1.1.1 Construction Impacts on Terrestrial Ecology

4.6.1.1.1.1.1 Construction Impacts on Vegetation

Direct impacts from construction activities at the proposed project for the deep Class V injection well disposal option will include vegetation disturbance (modification of structure, species composition, and areal extent of cover types) of about 98 ha [243 ac]. Indirect impacts will include…reduction of wildlife habitat

areas where vegetation was removed, the applicant has committed to reestablish vegetation concurrently with construction activities according to NRC licensee requirements to conduct reclamation under an approved site reclamation plan (Powertech, 2009a).

Construction of wellfields will be phased and some vegetation will be affected, but impacts will not generally affect a sizeable segment of any species' population. In general, vegetation

development in the region is expected to be sparse due to the limited amount of annual precipitation. To mitigate the potential impact to vegetation, disturbed areas will be both temporarily and permanently revegetated and tilled where soil has been compacted to promote vegetation growth in accordance with SDDENR regulations. Some encroachment from native populations and/or establishment of early successional species bordering disturbed areas will also be expected, which will facilitate the revegetation process. Additionally, the applicant will take mitigative measures to minimize the spread of noxious weeds (Powertech, 2009a).

No federally listed threatened or endangered plant species are known to occur within the proposed project area (FWS, 2010). The applicant commits to mitigation measures that will reduce the overall impacts, but vegetation could still experience long-term impacts especially within the sagebrush shrubland communities.

4.6.1.1.1.1.2 Construction Impacts on Wildlife

Indirect impacts could occur from displacement of wildlife from increased noise, traffic, or other disturbances associated with the development of the proposed project and from small reductions in existing or potential cover and forage due to habitat alteration, fragmentation, or loss. Indirect impacts typically persist longer than direct impacts. However, ISR uranium extraction does not generally involve large-scale habitat alteration.

Certain vegetative communities that exist in the proposed license area could be difficult to reestablish through artificial planting and natural seeding, and recovery could take many years. Consequently, wildlife species associated with specific habitats, such as blue grama (*Bouteloua gracilis)* grasslands and big sagebrush, could be reduced in number or replaced by generalist species with broader habitat requirements until natural reseeding of certain vegetation occurs or reclamation matures to its target mix.

The proposed project area is dominated by big sagebrush shrubland followed by greasewood shrubland, ponderosa pine woodland, and upland grassland. The latter three vegetative communities are almost equal in area. The wildlife species using these habitat types are limited in their occurrence in the proposed license area (see SEIS Section 3.6.1.2), and because the actual surface disturbance will be small and noncontiguous, negative impacts to these wildlife species will be SMALL.

In addition, the NRC staff conclude that construction impacts resulting from habitat loss or alteration, displacement of wildlife, and mortality due to encounters with vehicles or heavy equipment at the proposed project will be SMALL. The applicant commits to impose and enforce speed limits during all ISR phases to reduce impacts to wildlife throughout the year and particularly during the breeding season (Powertech, 2009a, Section 5.5).

To mitigate habitat disturbance, the applicant will use existing roads when possible and limit construction of new primary and secondary roads to provide access to more than one drill site (Powertech, 2009a). In addition, the applicant will restore areas where topsoil has been replaced and construct brush piles and rock piles to enhance wildlife habitat (Powertech, 2009a).

Big Game

Upland Game Birds

Raptors

The bald eagle, red-tailed hawk, American kestrel, and northern harrier were the most commonly seen raptor species in the proposed project area and will be the primary raptor species impacted by project activities. Raptors are particularly sensitive to noise and the presence of human activity, which will be heightened during the ISR construction phase. Five raptor nests (four active and one unknown) were recorded within the proposed project area during surveys conducted in 2007 and 2008, as summarized by species in SEIS Table 3.6-2 (Powertech, 2009a). Two other nest sites, one inactive and one defended but not confirmed active, occurred within 1.6 km [1 mi] of the proposed license area. As described in SEIS

Section 3.6.1.2.2, one active bald eagle nest was reported in 2011 within the proposed project area along Beaver Creek, about 1.6 km [1 mi] west of the proposed Dewey satellite processing plant.

Direct impacts to raptor species for the deep Class V injection well disposal option include displacement, loss of forage habitat, increased potential for collisions with structures and vehicles, increased potential for nest abandonment and reproductive failure due to increased human disturbances, and potential reduction in prey populations within the project site. Avian collision and electrocution with overhead power lines could occur year round. The potential for eagle collisions with electric transmission lines is considered to be low because their foraging behavior is relatively slow compared to falcons and other raptors. Indirect impacts to raptors could include nesting disruption and displacement of prey species, which may reduce food availability within the area. Nesting success by resident raptors could be reduced from disturbances caused by the proposed ISR construction and associated traffic. Birds may continue to use nest sites as they acclimate to the proposed ISR construction activities and could return to inactive nests in the area. The applicant has committed to adhering to timing and distance restrictions determined by appropriate regulatory agencies to protect raptor nests during breeding season (Powertech, 2009a). In addition, the applicant has committed to mitigation measures to limit noise and vehicular traffic (Powertech, 2009a) during the construction phase of the proposed project, which will reduce overall impacts to raptors. If a disturbance occurs (called a "take") where birds protected under the conventions are pursued, hunted, shot, wounded, killed, trapped, captured or collected in violation of the Bald and Golden Eagle Protection Act (BGEPA) and/or Migratory Bird Treaty Act (MBTA), the applicant will be required to perform a consultation and mitigation of the take with FWS. The applicant has committed to follow an FWS-approved raptor monitoring and mitigation plan to minimize conflicts between active nest sites and project-related activities if direct impacts to raptors occur (Powertech, 2009a). However, NRC staff anticipate there will be fewer direct impacts to raptors compared to a higher potential for indirect impacts. Mitigation measures provided in SEIS Chapter 6 will support the continued nesting success of area raptors and minimize potential direct and indirect impacts.

The applicant could mitigate potential impacts to raptor species from power distribution lines by following the Avian Power Line Interaction Committee guidance to avoid activities near active nests, especially prior to the fledging of young (Avian Power Line Interaction Committee, 2006). In addition, the applicant could site all planned facilities outside of the BLM-recommended buffer zone for all raptor nests identified within the proposed project area and adhere to BLM-recommended timing restrictions presented in table located in Table 4.6-3. Figure 4.6-2 shows the 16-ha [40-ac] areas where raptor nests are located near the proposed project area. The potential wellfield areas in Figure 2.1-6 identify where potential drilling/disruptive activity could occur around each orebody, if a particular orebody were mined. Based on the applicant's intent to follow a raptor mitigation plan and implementation of the mitigative measures previously described, the potential impact to raptor species during the construction phase of the proposed Dewey-Burdock ISR Project for the deep Class V injection well disposal option will be SMALL.

Waterfowl and Shorebirds

Eight avian species associated specifically with water and/or wetlands were observed during baseline surveys conducted at the proposed project site:

1. the American white pelican (*Pelecanus erythrorhynchos*),
2. great blue heron (*Ardea herodias*),
3. Canada goose (*Branta canadensis*),
4. mallard (*Anas platyrhynchos*),
5. American wigeon (*Anas americana*),
6. Killdeer (*Charadrius vociferus*),
7. long-billed curlew (*Numenius americanus*), and
8. upland sandpiper (*Bartramia longicauda*) (Powertech, 2009a).

Table 4.6-3. BLM Recommended Seasonal Wildlife Stipulations

In western South Dakota, long-billed curlew and upland sandpiper are often found in grasslands, but habitat requirements in this environment
are not well known (SDGFP, 2005a). As described in SEIS Section 3.6.1.2.2, the long-billed curlew is a rare species in South Dakota. A large portion of the curlew breeding range occurs in South Dakota, but does not include winter habitat (Fellows, 2009). The continued existence of the species is most threatened by fragmentation, vegetation conversion, and loss of breeding habitat consisting of open, mixed-grass prairie and grazed cattle pastures across its current breeding range (Fellows, 2009). Areas about 0.8 km^2 [0.5 mi^2] or larger of the upland grassland vegetative community {total 885.27 ha [2,187.56 ac]} are found in the Burdock area east of Pass Creek, which is more than in the Dewey area. Construction impacts will affect nesting and breeding curlew the most from early March to mid-July.

At the proposed Dewey-Burdock site, relatively little habitat exists to support large groups or populations of either waterfowl or shorebirds and no breeding waterfowl or shorebirds were observed during wildlife surveys; therefore, NRC does not expect that proposed construction activities for the deep Class V injection well disposal option will destabilize waterfowl or shorebird populations. The applicant has committed to use existing roads when possible and obtain USACE permits when appropriate before construction activities (SEIS Section 4.5.1.1.1.1.). These actions, in addition to reseeding and other mitigation measures explained in SEIS Section 4.6.1.1.1.1, will limit potential long-term impacts to waterfowl and shorebird habitat.

Construction impacts to nongame and migratory birds for the Class V injection well disposal option are expected to be similar to those discussed for other birds previously described in this section associated with forested, grassland, and shrubland vegetative communities. Some long-term habitat loss {up to about 98 ha [243 ac]} and potential reduction in the carrying capacity for nongame/migratory birds within the proposed project area will occur; however, there is habitat available regionally for displaced animals. Direct impacts will include habitat loss and fragmentation, alteration of plant and animal communities, overhead electric line collisions and electrocution, and increased human activity or noise that could cause collision mortality or the birds to avoid a specific area or reduce breeding efficiency.

Nongame and Migratory Birds

Direct loss of ground nests, eggs, and birds from construction activities could occur; however, these impacts will affect only a few birds and are not expected to have any long-term impacts on the general population of the individual species. NRC expects the proposed project will not influence migratory movement patterns, because most bird species are able to fly over the area without restrictions. Nongame and migratory birds will benefit from mitigation measures described in Chapter 6 because these will limit noise, vehicular traffic, and other human disturbances near these areas.

Other Mammals

A variety of small- and medium-sized mammal species occurs in all the vegetative communities present in the vicinity of the proposed license area, although not all have been observed on the proposed project area itself. These mammals include the coyote (*Canis latrans*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), badger (*Taxidea taxus*), beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), skunk (*Mephitis mephitis)*, porcupine (*Erethizon dorsatum*), bats (*Myotis* spp.), and weasel (*Mustela* spp.) (Powertech, 2009a). Prey
species including rodents (mice, rats, voles, shrews, pocket gophers, ground squirrels, squirrels, chipmunks, prairie dogs), jackrabbits (*Lepus* spp.), and cottontails (hares) (*Sylvilagus* spp.) could also inhabit the proposed project area.
Medium-sized mammals, such as rabbits, coyotes, and foxes, could experience some mortality or be temporarily displaced to other habitats during construction activities. Direct mortality or injury of some ground-dwelling small mammal species (e.g., voles, ground squirrels, mice) could be higher than for other wildlife because of their limited mobility and the likelihood they will

retreat into burrows if disturbed. They could potentially be impacted by topsoil scraping or staging activities. However, given the limited, noncontiguous areas that will be affected by topsoil-disturbing construction activities (see Table 4.2-1), NRC expects no major changes or reductions in small- or medium-sized mammalian populations. Indirect impacts from accidental spills will be short term and localized to the impact area. The small- and medium-sized mammal species that occur in the proposed project area have a higher reproductive potential than do more vulnerable wildlife species that require large home ranges and occur in lower densities, such as large mammals (BLM, 2009). Construction disturbance associated with vehicles, equipment, noise, and dust will potentially cause wildlife species associated with all habitat types to avoid the area temporarily during construction activities; however, NRC staff expect that the area will not be uninhabitable after construction ends; therefore, the potential impact to other mammals from construction of the proposed Dewey-Burdock ISR Project will be SMALL. Potential construction impacts to black-tailed prairie dogs (*Cynomys ludovicianus*) and swift fox (*Vulpes velox)*, state endangered and state threatened species, respectively, are detailed in SEIS Section 4.6.1.1.1.1.4.

Reptiles and Amphibians

Three amphibian and one reptile species [boreal chorus frog (*Pseudacris triseriata*), Woodhouse's toad (*Bufo woodhousei*), great plains toad (*B. cognatus*), and western painted turtle (*Chrysemys picta*), respectively], which commonly occur in the region, were observed in the western portion of the project area along Beaver Creek where there are no currently planned activities associated with the proposed deep Class V injection well disposal option (Powertech, 2009a). Several other unidentified lizard species were observed during wildlife surveys conducted at the proposed site in 2007 and 2008 (Powertech, 2009a). The proposed project area provides limited habitat for amphibians and turtles due to the lack of aquatic habitat, which is concentrated along Beaver Creek and in old mine pits that make up about 10 ha [24 ac] of the total 14 ha [35 ac] of wetland habitat within the proposed project area. Within the proposed project area, Beaver Creek is a perennial stream and Pass Creek is an ephemeral stream that supports some intermittent habitat. All Beaver Creek and Pass Creek tributaries are ephemeral. During construction activities, reptile and amphibian species will experience impacts similar to those discussed for small- and medium-sized mammal species, which include loss or fragmentation of habitat, displacement, disturbance from noise and human proximity, and increased risk of vehicular collision.

Because the applicant does not plan to disturb water bodies and perennial streams within the proposed project area (Powertech, 2009a), staff expect that aquatic habitat will not be directly affected by the proposed project activities. In addition, SEIS Sections 4.5.1.1.1.1 and 4.5.1.1.1.2 describe mitigative measures in accordance with NPDES permit requirements; these measures will control the amount of pollutants entering surface water bodies, such as streams, wetlands, and lakes. For these reasons, NRC staff conclude potential impact to amphibian and regional turtle species and reptiles that require a water body for survival will be SMALL. Other reptiles, such as lizards and snakes that prefer grassland habitat, may be more susceptible to the potential human disturbances previously described. However, due to the small amount of habitat {about 98 ha [243 ac]} that will be disturbed at any given time during the deep Class V injection well disposal option and low likelihood for direct mortalities, staff do not expect construction impacts to measurably affect any reptile species population. Therefore, the potential impact to reptile species during the construction phase will also be SMALL

4.6.1.1.1.1.3 Aquatic Ecology

GEIS Section 4.4.5.1 discussed impacts to aquatic species that could be temporarily disturbed by in-stream channel activities and concluded the potential impact will be SMALL. Sediment loads in streams are expected to taper off quickly both in time and distance, and long-term impacts will be SMALL. Additionally, SDDENR standard management practices will help to limit impacts to aquatic life. (NRC, 2009a)

Because of the limited and ephemeral nature of surface water at the proposed Dewey-Burdock

ISR Project, the occurrence of aquatic species is also limited. Potential impacts to aquatic species at the proposed project site will occur primarily along Beaver Creek, Pass Creek, scattered stock ponds, and drainages. Beaver Creek is a perennial stream that experiences annual low flow conditions (see SEIS Section 3.6) and does not support sensitive species within the proposed project boundary. Further, EPA lists Beaver Creek as an impaired water body partially due to high dissolved and suspended solids (EPA, 2009). Pass Creek is an ephemeral stream that supports some intermittent habitat. However, Pass Creek does not provide a year-round source of surface water sufficient to maintain a population of aquatic species. The applicant's surface water management plan will limit the loss of aquatic habitat resulting from planned construction activities at the proposed project (Powertech, 2009a).

4.6.1.1.1.1.4 Threatened and Endangered Species

Mitigation plans to avoid and reduce impacts to potentially affected species will be developed. (NRC, 2009a)

Sprague's pipit *(Anthus spragueii)*

Whooping cranes *(Grus americana)*

Black-footed ferrets (*Mustela nigripes*) are not present in the site vicinity at this time. the presence of the black-tailed prairie dog (*Cynomys ludovicianus*) in the northwestern corner of the proposed project area provides potentially suitable habitat for the black-footed ferret. Two other prairie dog towns were observed 1.6 km [1 mi] southwest of the proposed project area. The black-tailed prairie dog is a state endangered and BLM sensitive species (see Tables 3.6-7 and 3.6-8). discussed in SEIS Section 4.6.1.1.1.1.2 under Upland Game Birds. Listed threatened or endangered species or candidate animals will not be directly affected by construction activities for the deep Class V injection well option, nor will the habitats of these species' be noticeably altered.

State and BLM Species of Concern

In addition to the BLM sensitive species listed in Table 3.6-7 that could occur within the proposed project area, the following South Dakota-designated rare animals were observed within the proposed project area during wildlife surveys: long-billed curlew, great blue heron, golden eagle, Cooper's hawk, American white pelican, long-eared owl, merlin, Clark's nutcracker (*Nucifraga Columbiana*), ferruginous hawk, and plains topminnow (*Fundulus sciadicus*)

BLM sensitive species that are found in wetland or grassland/wetland habitats that could occur, but were not observed, during surveys at the proposed site [marbled godwit (*Limosa fedoa*), trumpeter swan (*Plegadis chihi*), willet (*Cataptrophorus semipalmatus*), and Wilson's phalarope (*Phalaropus tricolorl*)] and South Dakota rare animals observed during Dewey-Burdock wildlife surveys (long-billed curlew, great blue heron, and American white pelican in Table 3.6-8) are unlikely to be affected by construction activities because fairly limited suitable habitat exists year round to support large groups or populations of either waterfowl or shorebirds. None of the waterfowl or shorebirds observed during wildlife surveys were breeding; therefore, NRC staff do not expect that proposed construction activities will destabilize sensitive waterfowl or shorebird populations.

Raptors listed as BLM sensitive species that could occur at the proposed site are bald eagle, burrowing owl, ferruginous hawk, golden eagle, peregrine falcon *(Falco peregrines*), and Swainson's hawk (*Buteo swainsoni)*. Each of these BLM sensitive species is protected under the MBTA, and the bald and golden eagles are also protected under the BGEPA. Similar to the bald eagle, the peregrine falcon is designated as threatened in South Dakota, but the peregrine falcon was not observed in the proposed project area. The peregrine falcon was once a federally listed species, but it was delisted in 1999. The falcon was presumed to be extirpated from the state by 1980 (USGS, 2006) and is not likely to occur within the proposed project area, although there are recent urban reintroduction efforts to restore the bird to the state (SDGFP,

2012b). Burrowing owls are dependent on large prairie dog towns for food and nesting in western South Dakota (SDGFP, 2005a,b). Several predatory raptor species, such as the ferruginous hawk, feed on prairie dogs and other small vertebrates or burrowing animals found in prairie dog towns. Some raptors, such as the Swainson's hawk, feed primarily on insects. During breeding season, the Swainson's hawk may consume small vertebrates.

State rare raptor species observed in the project area were Cooper's hawk, long-eared owl, and merlin. Each species is also protected under the MBTA. All raptors that occur at the proposed project site will experience potential impacts similar to those described for raptors in SEIS Section 4.6.1.1.1.1.2. Raptors are particularly sensitive to noise and the presence of human activity, which will be heightened during the construction period. As described in SEIS Section 4.6.1.1.1.1.2, injury and mortality from encounters with power lines will be minimized by the applicant's proposed use of raptor deterrent products and following regulatory timing and spatial restrictions with respect to construction activities near raptor nests. The applicant has also committed to follow an FWS-approved raptor monitoring and mitigation plan to minimize conflicts between active nest sites and project-related activities if direct impacts to raptors occur (Powertech, 2009a). Nest abandonment and loss of eggs or fledglings could occur in raptor nests proximate to construction activities, especially during the early nesting period. Because of the presence of raptors within the proposed project area, sensitive and rare raptor species could be disturbed. However, the NRC staff conclude direct impact to raptors is unlikely and the continued existence of the species in the proposed project area will not be threatened due to proposed mitigation measures; these are further detailed in Chapter 6 and include best management practices for monitoring species.

Nongame and migratory birds, such as the Chestnut-collared longspur (*Calcarius ornatus),* dickcissel (*Spiza americana),* and long-billed curlew, may occur within the proposed project area, most likely in the upland grassland vegetative community. The loggerhead shrike (*Lanius ludovicianus)* and blue-grey gnatcatcher (*Polioptila caerulea)* may also occur within the proposed project area, most likely in the shrubland communities. All of these birds are BLM sensitive species and protected by the MBTA. The gnatcatcher and curlew are also rare state species. Potential impacts from construction on the long-billed curlew and nongame and migratory birds are discussed in SEIS Section 4.6.1.1.1.1.2. NRC staff expect that similar potential impacts described in SEIS Section 4.6.1.1.1.1.2, including injury or mortality from vehicles and electrical lines, fragmentation, vegetation conversion, and loss of breeding habitat, for nongame and migratory birds will also potentially impact chestnut-collared longspur, dickcissel, loggerhead shrike, and blue-grey gnatcatcher. For the proposed Dewey Conveyor Project, which is less than 1.6 km [1 mi] from the proposed Dewey-Burdock ISR Project, BLM staff concluded that while some species reliant on grassland habitat could be displaced, the area contains high density, undisturbed grassland and disturbed grassland species will use similar adjacent habitat (BLM, 2009). The staff also conclude that the grassland habitat in the vicinity of the proposed Dewey Burdock project area will temporarily support grassland species of concern that may be disturbed during construction. Further, NRC staff expect applicant mitigation measures, like those described in SEIS Section 4.6.1.1.1.1.2 and Chapter 6, will prevent destabilization of habitat or populations for these species.

Clark's nutcracker (*Nucifraga columbiana*), a BLM sensitive species and state rare species, is a nongame bird that was observed flying over the proposed project site during wildlife surveys. Nutcrackers prefer conifer forests (South Dakota Birds and Birding, 2012) and will most likely occur in the ponderosa pine woodland vegetative community in the proposed project site. Black-backed woodpecker (*Picoides arcticus),* veery (*Catharus fuscescens)*, and three-toed woodpecker (*Picoides tridactylus)* are all BLM sensitive species that inhabit forested areas such as the ponderosa pine woodland and cottonwood gallery vegetative communities. The red-headed woodpecker (*Melanerpes erythrocephalus),* a BLM sensitive species and state rare species, inhabits the edge of forested areas near open clearings. All of these birds are protected by the MBTA. NRC staff expect that potential impacts to these nongame and migratory birds associated with forest habitats will be less than those potential impacts

described for nongame and migratory birds associated with grassland and shrubland habitats because (i) NRC expects that little to no treed areas will be directly disturbed during construction compared to other habitat types that will experience long-term or permanent impacts; (ii) the applicant has stated that no woody corridors will be disturbed by the proposed activities (Powertech, 2009a); and (iii) potential forest habitat is located in the adjacent BHNF dominated by ponderosa pine and other deciduous trees (Chapman, 2004) that could support displaced birds that depend on forest habitats.

Two mammals, the black-tailed prairie dog (*Cynomys ludovicianus*), a state endangered species and BLM sensitive species, and the swift fox (*Vulpes velox)*, a state threatened species and BLM sensitive species, could potentially occur within the project area. As described earlier in this section and in SEIS Section 3.6.3, a black-tailed prairie dog colony is located proximate to potential wellfields D-WF3 and D-WF4 in the Dewey area and proposed standby land application sites; therefore potential direct impacts could affect prairie dogs if the wellfields and land application sites are used. A 2008 survey reported that the prairie dog populations more than doubled in Custer and Fall River Counties between 2003 and 2008, and that state prairie dog 2008 conservation population goals were met (Kempema, et al., 2009). Because of management programs to protect the species, prairie dog populations in South Dakota are stable where the species occurs in most of the western two-thirds of the state (SDGFP, 2012d). According to SDGFP, private landowners and the public are allowed to shoot prairie dogs on private lands to manage the population in prairie dog towns (SDGFP, 2005b). Therefore, NRC expects that management of prairie dogs will be conducted in accordance with applicant and land owner agreements.

The swift fox is typically found in short mixed grass prairies and preys on prairie dogs in addition to other small mammals and their carcasses, birds, insects, reptiles, fruits, and berries (FWS, 2000a). Swift fox are burrowing animals known to dig their own dens or use the burrows of other animals, including those made by prairie dogs. Because of their association with prairie dogs, swift fox that may occur in the proposed project area could be affected by prairie dog control efforts, thereby limiting available food, shelter, and escape cover for swift fox (FWS, 2000a). Other threats include the fact that swift fox are easily trapped or shot and can experience mortality from vehicle collisions (FWS, 2000a). Swift fox have demonstrated the ability to adapt to prairie-agricultural, sagebrush-grassland, and sagebrush-greasewood habitat types and to not be dependent on prairie dog colonies for their food (FWS, 2000a). For the proposed Dewey Conveyor Project, BLM concluded activities may impact individual prairie dogs and swift foxes or their habitat, but will not cause instability in their populations The banded killifish (*Fundulus diaphanous),* a BLM sensitive species and state endangered species found in the western part of the state, and the northern redbelly dace (*Phoxinus eos*), a BLM sensitive species and state threatened species, were not observed or expected to occur in western South Dakota or Custer or Fall River Counties (SDGFP, 2012c; Table 3.6-7). As discussed in SEIS Section 3.5.1, with the exception of perennial Beaver Creek, the streams within the proposed project area generally only flow during the wet season in response to snow melt or precipitation events. Beaver Creek and Pass Creek do not provide continuous, stable aquatic habitat to support these aquatic species; therefore, NRC staff predict potential impacts to be SMALL.

Table 3.6-7 lists BLM sensitive amphibians, including frogs, and reptile species, including snakes and turtles, that could occur in the proposed project area. The snapping turtle (*Cheldy serpentine)* will be one of the most likely BLM sensitive turtle species to occur in the area (Bandas, 2004), although snapping turtles were not observed during wildlife surveys. This species can be found in any permanent water body in the state and are rarely seen out of the water except for nesting and basking in the sun (Bandas, 2004). The spiny softshell turtle (*Apalone spinifera*) is a state rare species that prefers highly oxygenated, fast flowing rivers, lakes, and streams, but is also found in impoundments and reservoirs (Somma, 2011; Bandas, 2004). As described in SEIS Section 3.6.1.2.3, the applicant reported a spiny softshell subspecies in Beaver Creek during fish surveys downstream of the proposed project area.

Turtles usually spend the winter in rivers, lakes, streams, and reservoirs with muddy or sandy bottoms and require soil exposed to sunlight, often near sand or gravel bars, during late spring or summer for a proper nest environment (Somma, 2011). Common toads and frogs were observed during wildlife surveys, but BLM sensitive amphibian species were not reported. For the same reasons explained in SEIS Section 4.6.1.1.1.1.2, NRC concludes potential impact to these sensitive reptiles and amphibians will be SMALL.

4.6.1.1.2 Operations Impacts

However, NRC staff considers such chronic direct wildlife exposure to undiluted wastewater unlikely because the applicant's proposed wastewater controls (e.g., pond design, leak detection and mitigation, pressure monitoring) and SDDENR permitting requirements will limit direct contact that aquatic life and terrestrial wildlife have with wastewater solutions. The SDDENR controls include limiting access to wastewater with fencing and implementing an **avian protection plan** for pond operations.

5.6 Ecological Resources

5.6.1 Terrestrial Ecology

5.6.2 Aquatic Ecology

5.6.3 Protected Species

6.2 Mitigation Measures Proposed by Powertech

Table 6.2-1. Summary of Mitigation Measures Proposed by Powertech

p.6-9 Prepare U.S. Fish and Wildlife Service (FWS)-approved raptor monitoring and mitigation plan to minimize conflicts between active nest sites and project-related activities if direct impacts to raptors occur.

p. 6-15 Adhere to timing and spatial restrictions within specified distances of active raptor nests as
determined by appropriate regulatory agencies [e.g., U.S. Fish and Wildlife Service, South Dakota Game, Fish, and Parks, and BLM).

6.3 Potential Mitigation Measures Identified by the U.S. Nuclear Regulatory Commission

7.4 Ecological Monitoring

7.4.1 Vegetation Monitoring

7.4.2 Wildlife Monitoring

ML091200014 ER Documents

https://adamswebsearch2.nrc.gov/webSearch2/view?AccessionNumber=ML091200014